



# Disparities in health in the United States: An overview of the social determinants of health for otolaryngologists

## Citation

Bergmark, Regan W., and Ahmad R. Sedaghat. 2017. "Disparities in health in the United States: An overview of the social determinants of health for otolaryngologists." *Laryngoscope Investigative Otolaryngology* 2 (4): 187-193. doi:10.1002/lio2.81. <http://dx.doi.org/10.1002/lio2.81>.

## Published Version

doi:10.1002/lio2.81

## Permanent link

<http://nrs.harvard.edu/urn-3:HUL.InstRepos:34491903>

## Terms of Use

This article was downloaded from Harvard University's DASH repository, and is made available under the terms and conditions applicable to Other Posted Material, as set forth at <http://nrs.harvard.edu/urn-3:HUL.InstRepos:dash.current.terms-of-use#LAA>

## Share Your Story

The Harvard community has made this article openly available.  
Please share how this access benefits you. [Submit a story](#).

[Accessibility](#)

# Disparities in Health in the United States: An Overview of the Social Determinants of Health for Otolaryngologists

Regan W. Bergmark, MD ; Ahmad R. Sedaghat, MD, PhD 

**Objectives:** Social determinants of health include social and demographic factors such as poverty, education status, race and ethnicity, gender, insurance status, and other factors that influence (1) development of illness, (2) ability to obtain and utilize healthcare, and (3) health and healthcare outcomes. In otolaryngology, as in other subspecialty surgical fields, we are constantly confronted by patients' social and demographic circumstances including poverty, language barriers, and lack of health insurance and yet there is limited research on how these factors impact health equity in our field, or how attention to these patient characteristics may improve health equity. This review provides the reader with a framework to understand the social determinants of health including how socioeconomic status, insurance status, race, gender, and other factors impact health.

**Data Sources and Review Methods:** Foundational papers on the social determinants of health are reviewed, as well as otolaryngology publications focused on health and healthcare disparities.

**Results:** The social determinants of health have a major impact on patient health as well as healthcare utilization, but there is a relative lack of data on these factors and how they can be addressed within otolaryngology. Incorporating tools to measure social and demographic characteristics and actually report on these measures is a first simple step to increase the data on the social determinants of health as they pertain to otolaryngology.

**Conclusion:** More research is needed on the social determinants of health, and how they impact otolaryngic disease. Medicare's Accountable Care Organization models will increasingly change the way in which physicians are reimbursed, making the social determinants of health central not only to our moral conscience but also the bottom line.

**Key Words:** Healthcare disparities, healthcare delivery, insurance, socioeconomic factors, primary care, uninsured, Medicaid.

**Level of Evidence:** 4

## INTRODUCTION

Social determinants of health are defined as the demographic and social factors that underlie development of illness, access to medical care, adherence to treatment plans, and outcomes.<sup>1,2</sup> Mortality is more closely tied to the social determinants of health than to medical care per se. Patients who are poor or part of an ethnic or racial minority are more likely to have a smoking history and less likely to have access to medical care. Technically perfect surgery can have poor results if underlying social determinants of health are not considered—a waste for both patient and surgeon. As in clinical vignette 1 (Fig. 1) below, the development, timely diagnosis and treatment of oropharyngeal squamous cell carcinoma (OPSCC) is

intimately tied to social determinants of health such as human papillomavirus (HPV) vaccination status, smoking history, poverty, health literacy, and health insurance status. Other factors such as race also impact whether patients present with early or late stage OPSCC. The ability to intervene and prevent or successfully treat OPSCC therefore hinges partly on understanding at-risk groups as well as racial, gender, and socioeconomic disparities in head and neck cancer prevalence.<sup>3</sup>

While not a common focus in otolaryngology, social determinants of health have been heavily researched in other medical fields with a focus on restoring health equity and good outcomes for patients of all backgrounds. Health equity is founded in ethics and human rights principles.<sup>4–6</sup> *Structural violence*, a term popularized by the renowned physician and medical anthropologist Dr. Paul Farmer, refers to “social arrangements that put individuals and populations in harm’s way.”<sup>7</sup> Structural violence for otolaryngology patients may include things such as lack of health insurance or healthcare access, poor health literacy, poverty, exposure to violence or trauma, and discrimination leading to poor health or healthcare outcomes. Farmer advocates for interventions that eliminate the barriers disadvantaged patients have to seeking care, and has used his approach to dramatically improve morbidity and mortality across disease processes in multiple countries including Haiti and the United States.

Despite their obvious importance in prognosis and clinical care, measures of social determinants of health are

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

From the Department of Otolaryngology, Massachusetts Eye and Ear Infirmary; and the Department of Otolaryngology, Harvard Medical School, Boston, Massachusetts, U.S.A.

Editor's Note: This Manuscript was accepted for publication 28 March 2017.

No financial support was received for this study.

None of the authors have relevant conflicts of interest to report.

Send correspondence to Regan W. Bergmark, MD, Department of Otolaryngology, Massachusetts Eye and Ear Infirmary, Harvard Medical School, 243 Charles Street, Boston, MA 02114. E-mail: regan\_bergmark@meei.harvard.edu

DOI: 10.1002/liv.2.81

## Clinical vignette 1

*A thirty-three year old man living in a rural area developed a sore throat three months ago. Initially he thought that he had a cold. He had been recently laid off from his construction job, at which time he lost his health insurance, so he did not seek medical care. He eventually went to a pharmacy-based urgent care where he received antibiotics and was told to see his primary care doctor. His sore throat was ultimately not responsive to antibiotics and because he did not have a primary care physician, he was unable to arrange appropriate follow up.*

*He eventually presented to a local emergency department with severe difficulty swallowing. A large mass was seen on oropharyngeal exam involving the right tonsillar fossa and base of tongue. He was also found to have a right-sided neck mass. He was admitted for malnutrition and subsequent evaluation including direct laryngoscopy with biopsy and imaging confirmed an HPV+ T4N2bM0 squamous cell carcinoma (SCCa). He had never received an HPV vaccine.*

*Although he qualified, he had not applied for Maine's Medicaid insurance program and social workers were needed to help him apply for insurance. He was referred to a tertiary care center for multimodality treatment but had trouble arranging transportation and missed his initial appointment. He was eventually treated with chemoradiation and experienced a good response with complete remission. However, he now has significant medical costs due to his initial hospitalization and workup, which occurred prior to when he obtained insurance. He is also having difficulty obtaining follow up imaging due to the cost of care and difficulty with navigating his insurance.*

Fig. 1. Clinical vignette 1.

not frequently a focus of research or clinical investigation in otolaryngology and warrant further development and utilization. For some disease processes such as chronic rhinosinusitis, national prevalence studies reveal an underrepresentation of poorer patients and patients from ethnic minorities; are these patients not getting sick or—perhaps more likely—simply not making it in to subspecialty centers, never being diagnosed, and never being treated? Public reporting of outcomes by race and socioeconomic status (SES) has been advocated as an approach to examining and reducing healthcare inequity.<sup>2</sup> Delineating the reasons for health inequity on a societal level allows for effective and meaningful intervention.<sup>8</sup>

Aside from the moral ramifications, social determinants of health will increasingly matter for reimbursements from Medicare and in Accountable Care Organization (ACO) models, for physicians in all fields, as well as in bundled payment models.<sup>9,10</sup> In ACO models, a patient's overall health outcome as well as cost of care will affect reimbursement and will define whether a provider or institution is considered high or low performing. Assuming these are not fully eliminated in the rapidly changing health policy arena, initially there will be incentives to perform highly. Eventually it is expected that patients will be preferentially shunted to high value providers. While many ACO outcomes measures currently focus on chronic medical diseases or common medical conditions, there will likely be increasing emphasis on surgical outcomes and management.<sup>11</sup> Factors impacting

patient outcomes, such as chronic disease management, smoking status and preventative health measures that are affected by social determinants of health may directly impact reimbursement. They therefore will need to be considered part of the routine care of patients, even for subspecialty surgical practices.

## The Divide: Health Expenditures and Health Outcomes

In the United States, health outcomes have not matched healthcare expenditures because very little is invested in public health measures to address the social determinants of health.<sup>12</sup> Contrary to what many in the United States may think, Americans do not have the best health status worldwide. In fact, the United States was not in the top 30 countries for longest life expectancy.<sup>13</sup> Among wealthy countries, life expectancy is not correlated with healthcare expenditures as a percent of Gross Domestic Product (GDP); likewise, within the United States, life expectancy is not correlated with health expenditures in state to state comparisons.<sup>12</sup>

Policy makers often seem perplexed that there is a chasm between healthcare/medical expenditures and health outcomes such as life expectancy and mortality rates. However, in the United States, healthcare expenditures are heavily weighted toward medical care and not toward public health. Medical care in this country has mostly been reactive rather than proactive—high costs are paid when patients have a problem but not so for prevention. For example, we see dramatic efforts and billions of dollars spent to treat cancer caused by smoking while funding and energy spent for anti-smoking campaigns have somewhat stalled. For the patient with oropharyngeal cancer described in clinical vignette 1 (Fig. 1), the opportunity for prevention with HPV vaccination was missed; early detection with the possibility of simpler (and less costly) treatment was thwarted by lack of insurance and healthcare access, and ultimately the patient presented with late disease requiring a higher-cost and more morbid treatment.

## Social determinants of health

Social determinants of health encompass the socioeconomic and demographic factors that influence how and why patients get sick, healthcare utilization, and outcomes.<sup>1</sup> By definition, these elements are broad, and here we seek to summarize some of the foundational research on specific categories of social determinants of health. Social determinants of health have garnered more attention in the past 15 years through multiple initiatives globally including the United States government's Healthy People initiatives,<sup>1</sup> the World Health Organization's Commission on Social Determinants of Health in 2005 and attention by the Kaiser Family Foundation.<sup>14</sup> Healthy People 2020 defined the social determinants of health in broad categories as "Economic Stability, Education, Health and Health Care, Neighborhood and Built Environment, and Social and Community Context."<sup>15</sup> Across the world, behavioral, environmental,

## Clinical vignette 2

*A 28 year old woman with cystic fibrosis and chronic rhinosinusitis worked two jobs to make ends-meet and also cared for her two kids as a single mother. She had trouble affording her co-payments and, as a result, often did not call or present for care until she was very ill and in need of hospital admission. She also had difficulty affording her many prescriptions and sometimes could not afford to fill them on time.*

Fig. 2. Clinical vignette 2.

occupational and metabolic (ie, dietary, physical activity) risk factors explain more than half of mortality.<sup>16</sup>

Separate consideration of each social determinant of health and how they interact is critical to identify at-risk otolaryngology patients, as well as areas of potential intervention and improvement at the patient or policy level. For example, for the patient in clinical vignette 1 (Fig. 1), the timing of and advanced stage at presentation, and the ultimate clinical outcome could have been impacted by policies targeting vaccination and primary care access, insurance coverage, or other factors. In this section, we will focus on three major social determinants of health: (1) SES, (2) insurance status and healthcare access, and (3) race and ethnicity. Other determinants of health, such as gender and language—each of which deserves its own review—are summarized briefly.

### Socioeconomic Status

Income, economic stability, and education status profoundly affect patients' health and well-being, and their ability to access and utilize medical care effectively, as illustrated by clinical vignette 2 (Fig. 2). Patients of low SES are more likely to suffer from chronic diseases "often as a result of social disadvantages and vulnerability."<sup>17</sup> An abundance of research from the 1960s to the present day has found that wealthier and more educated people live longer.<sup>18–20</sup> In describing Aaron Antonovsky's seminal work on SES and life expectancy,<sup>20</sup> the World Health Organization stated that the, "inescapable conclusion was that social class influenced a person's chance of staying alive."<sup>8,20</sup> In the Whitehall Studies of the British Civil Service, for example, lower-ranking officers were more likely to have multiple risk factors for disease—they were more likely to be obese, have hypertension, be sedentary, and smoke; they had higher rates of cardiovascular mortality even when these factors were controlled for.<sup>18,19</sup> Although not specifically included in their manuscripts, it is likely they had higher rates of head and neck cancer than their higher-ranking peers for all of these reasons. While lower SES is correlated with mortality and morbidity, public health interventions aimed at an entire population also consistently benefit the wealthy before they reached the poor.<sup>21</sup>

What mediates the association between lower SES and higher mortality? Individuals of low SES are more likely to suffer from illness because they are more likely to be exposed to disease risk factors<sup>17</sup> and less likely to

obtain healthcare, as illustrated by clinical vignette 2 (Fig. 2). Disease risk factors are associated with urban poor areas, and poor access to healthy food and outdoor space. Individuals of low SES are less likely to have good health literacy. Patients who do not have economic security are less likely to be able to negotiate for time away from work for medical appointments, or to be able to sacrifice paid hours of work to take care of their health. Low SES patients are also less likely to be able to access and utilize healthcare, independent of insurance status, for example by influencing their ability to pay co-pays for physician visits or medications. For the patient in clinical vignette 2 (Fig. 2), these barriers resulted in more frequent and severe sinus and pulmonary infections and more frequent hospitalizations—ultimately, a faster progression of her disease.

### Insurance Status and Healthcare Access

The health insurance environment is rapidly changing, and patients who require regular otolaryngic care and surveillance for conditions such as chronic otitis media, hearing loss, chronic rhinosinusitis, recurrent respiratory papillomatosis, sleep apnea, head and neck malignancy may be facing loss of or major changes in their insurance status in the near future. Insurance coverage significantly impacts healthcare utilization and outcomes independent of confounding factors such as SES.<sup>22</sup> Although the number of uninsured has dropped with the Affordable Care Act, there were still 36 million uninsured people (accounting for 11.5% of the population) in the United States in 2014, with 51.6 million uninsured at some point in the prior year.<sup>23</sup> Nearly 6 million of the 170 million individuals who do have insurance were covered in 2014 under "private plans through the Health Insurance Marketplace or state based exchanges" that were implemented as a part of the Affordable Care Act.<sup>23</sup> By 2015 the national percentage of uninsured patients dropped to 9%.<sup>24</sup> However, insurance coverage levels do vary significantly by state due to differences in Medicaid enrollment and policy structure, state poverty levels, and other factors.<sup>24–26</sup>

Many studies have shown that patients with Medicaid and the uninsured have disproportionately worse negative health outcomes than patients with private insurance or Medicare. This disparity represents a major healthcare problem impacting more than one in four Americans.<sup>24</sup> In otolaryngology there is poor understanding of how insurance status impacts referral status, treatment patterns, and outcomes of otolaryngic diseases. However, population-level findings describing the impact of insurance status on healthcare are broadly applicable and likely influence sub-specialty care as much as, perhaps more so, than in the realm of general medicine.

The uninsured are more likely to be unable to access medical care and to have adverse healthcare outcomes than privately insured patients.<sup>22</sup> These individuals are less likely than the privately insured to have seen a doctor in the past year and to have received preventative health services such as a flu vaccine.<sup>26</sup> This



disparity in healthcare access extends to Medicaid patients as well.<sup>27</sup> Studies have shown that uninsured patients or those with Medicaid have more difficulty finding a medical office that will accept them,<sup>28,29</sup> experience longer wait times for appointments, and are less likely to have a primary care physician with extended daytime or weekend hours when compared to the privately insured. A recent study in which more than 12,000 calls were made to primary care physician offices found that 85% of privately-insured patients were able to make an appointment versus 58% of Medicaid patients and only 15% of the uninsured if the cost paid at the time of the visit was restricted to \$75 or less.<sup>30</sup> While a similar study has not yet been done to our knowledge in otolaryngology, it is likely that the trends remain the same.

It is not surprising then that individuals with Medicaid or the uninsured may present at a later stage in any disease process. This effect has been reported for a number of otolaryngic conditions, for example, Medicaid or uninsured patients presenting with more advanced medullary thyroid cancer at the time of diagnosis.<sup>25</sup> In head and neck cancer patients, Medicaid insurance is associated with higher T and N classifications at time of diagnosis, longer time from diagnosis to initiation of treatment, lower rates of locoregional control, and decreased overall survival compared to private insurance.<sup>31</sup>

One downstream effect of poor access to primary care by those with Medicaid and the uninsured is that these patients, out of necessity, consequently seek care in an emergency department (ED). Given the excessive cost and inefficiency of ED utilization versus primary care visits, as well as an underlying etiology of ED visits attributed to poor primary care access, ED utilization has garnered intense interest in discussions of health policy. Patients with Medicaid or no insurance make up a disproportionately large percentage of ED visitors, for a variety of reasons.<sup>30</sup> Only 29% of ED pediatric and adult patients had private insurance across all ages in 2012,<sup>32</sup> even though 63.9% of Americans had private insurance that year.<sup>33</sup> The remainder of ED patients had coverage through Medicaid or the State Children's Health Insurance Program (SCHIP) (25%), Medicare (18%) or were uninsured (14%), with the other patients classified as "other."<sup>32</sup>

We have studied uncomplicated acute rhinosinusitis (ARS), a common otolaryngic disease that results in over 30 million physician visits per year, as a model disease for understanding healthcare utilization according to insurance status. In our studies, we found that Medicaid (OR = 10.82,  $P < .001$ ) and self-pay status (OR = 9.14,  $P < .001$ ) are strongly associated with presentation to an ED for uncomplicated ARS, independent of other demographic or socioeconomic factors.<sup>34</sup> When investigating why that may be the case, we found an association between Medicaid or no insurance with overnight ED presentation, suggesting lack of access to after-hours primary care.<sup>35</sup> Lack of evening office hours is a common reason for ED presentation.<sup>36</sup> We also examined whether the quality of primary care received by Medicaid patients was a driver of their disparately more frequent

ED use. However, we did not find any deficits in quality-of-care indicators such as time spent with a physician or likelihood of seeing one's own physician for patients with Medicaid in comparison to privately insured patients.<sup>37</sup> Our findings suggested that poor access may have a greater impact on ED use for ARS by Medicaid, rather than the quality of care they receive at PCP offices. Looking at more than 37 million PCP and ED visits for uncomplicated ARS, we also found no differences in antibiotic prescribing patterns between the outpatient PCP and ED settings, and likewise found no differences in prescribing patterns by insurance status, for pediatric and adult patients.<sup>38</sup> These findings suggested that patients' expectation for a specific treatment likely does not drive disparate ED utilization either for ARS. Interestingly, we did find that amongst ED visits for ARS, uninsured patients reported higher pain levels compared to the privately insured while Medicaid patients did not differ symptomatically from the privately insured.<sup>39</sup> Thus in our study of uncomplicated ARS, we find insurance-specific healthcare disparities that are comparable with nationwide results but we also identify nuances, such as lack of access for Medicaid patients and greater symptom (ie, pain) severity for the uninsured, that drive ED presentation. These factors must be considered, preferably on a disease-by-disease basis, when designing interventions or health policy. Thus, there is a great need for further research, even within otolaryngology, to determine the *reasons* for the associations of health insurance with healthcare utilization and outcomes.

### ***Race and Ethnicity***

Race, ethnicity, and racism are often not addressed or discussed in otolaryngology except as variables in studies, but research in other fields and ours shows that racial and ethnic minorities have more health risk factors and are more likely to suffer delays in treatment or poor outcomes. In addition to traditional barriers to care like insurance, racial and ethnic minorities are often disproportionately burdened by other risk factors for disparate healthcare as well. For example, it has been shown that there are fewer healthcare providers in minority zip codes, potentially leading to more difficulty obtaining routine screening and early detection services.<sup>40</sup> Language and cultural barriers may also limit the quality of care for patients in minority racial and ethnic groups or who are not native English speakers.

The Institute of Medicine's sweeping report on racial and ethnic disparities in 2003 opened by saying, "racial and ethnic minorities tend to receive a lower quality of healthcare than non-minorities, even when access-related factors, such as patients' insurance status and income, are controlled."<sup>41</sup> Racial and ethnic minorities also are significantly underrepresented as physicians in surgical subspecialties, which means not only patient care but also decision making at a leadership level within surgical subspecialty fields does not adequately represent the U.S. population.

Multiple major otolaryngic diseases disparately impact specific racial or ethnic minority groups due to

risk factors, access to care and quality of care. For example, American Indians with head and neck cancer have been shown to have worse survival compared to White patients and this finding is associated primarily with socioeconomic and demographic risk factors such as alcohol abuse history, living far from a hospital, lack of private insurance, and late-stage presentation.<sup>42</sup> In contrast, multiple traditionally recognized factors for such disparity in survival, such as HPV status, tumor site and grade, and time to treatments were not significantly different between groups.<sup>43</sup> In a recent influential study, Dr. Sunshine Dwojak and her colleagues demonstrated the success of easily implemented community-based head and neck cancer screening programs for the American Indian population, with a high positive screening rate of 8%.<sup>44</sup>

African Americans also have a higher incidence of head and neck cancer in addition to lower 5-year survival rates compared to White patients.<sup>45</sup> This disparity has been attributed to demographic factors including insurance status, health education, and “a sense of mistrust that is seen in the African-American population.”<sup>45</sup> Independent of other factors, African American patients also have a higher likelihood of having Medicaid or no insurance, and less access to an academic medical center. African Americans, who as a population are disproportionately more economically disadvantaged, have also been shown to have financial barriers to head and neck cancer screening.<sup>46</sup> Racial minority zip codes have been associated with lower prevalence of physician providers and higher prevalence of head and neck cancer than White-predominant zip codes.<sup>40</sup> For patient who are able to access care, adherence to evidence-based guidelines may still be unequal. For example, one study showed that African Americans had a lower likelihood of receiving treatment that adhered to national guidelines for medullary thyroid cancer, corresponding to decreased survival rates.<sup>47</sup> However, equity is achievable. In a study of laryngeal cancer patients in the Veterans Affairs Healthcare System, African American patients presented at the same stage and received treatment that equally adhered to guidelines compared to White patients.<sup>48</sup> African American patients correspondingly had equal survival rates as White patients.<sup>48</sup>

With personalized medicine on the horizon, it is also important to realize that racial disparities may extend to the realm of molecular medicine as well. Racial differences in the prevalence of specific head and neck cancer mutations, for example, have been found.<sup>49</sup> As our field’s understanding of cancer genetics grows, the importance of including racial and ethnic minorities in research efforts becomes even more critical—ensuring that the genetic diversity of the highest risk groups is included in major genetic studies and clinical trials.

### **Other factors**

Multiple other factors can be included in the social determinants of health, including gender, sexual identity and orientation, language and religion, nationality, immigration status, legal status, exposure to violence, housing

security, and many other aspects of a patient’s social environment.

Gender is an important determinant of risk factors for multiple diseases. The risk factors for head and neck squamous cell carcinomas, such as lack of HPV vaccination, high risk sexual behavior, and smoking all differ by gender.<sup>50</sup> Higher HPV rates are thought to play a disproportionate role in rising OPC rates in men, while rising smoking rates in women are central to rising cancer rates.<sup>50</sup> HPV conversion has been found to differ by gender and also impacts HPV positivity and thus oropharyngeal cancer risk. Many cancers show increased survival for women, but the reasons for this—such as earlier presentation, hormonal or genetic influences, differences in environmental exposure or other factors—likely vary by cancer are not well understood.<sup>51</sup> Contributing to our gap in knowledge, women are greatly underrepresented as subjects in biomedical research.<sup>52</sup> In one study, women made up only 38.8% of trial participants in an analysis of 661 cancer trials for non-gender-specific cancers.<sup>52</sup>

A patient’s social support system including family, friends, and religious community may impact the ability of a patient to seek and obtain medical care. Social networks, Internet and computer access, and the ability to connect with other patients who have a similar disease or to read about one’s illness may impact where patients obtain medical care, their adherence, and psychological wellbeing. These factors have been shown to be important in patients with chronic diseases, such as cystic fibrosis for example.<sup>53</sup> However, little is known about the impact of patients’ social support systems on care, treatment and outcomes for otolaryngic diseases.

In addition to the social determinants of health, the physical determinants of health such as geography and physical environment are also critical. Physical environment may determine allergen exposure, air quality, sun exposure, ability to exercise, and other aspects of their life that will determine propensity for illness. Children in poor urban areas, for example, are more likely than children in wealthy areas to have severe and uncontrolled asthma, often associated with exposure and allergy to cockroaches, rats and mice.<sup>54–56</sup> Patients in poor urban areas may also have more severe or poorly controlled chronic rhinosinusitis, but the studies simply have not been done to investigate that.

### **Metrics for Social Determinants of Health**

Challenges in measurement of disparities in health and healthcare outcomes start with a lack of information about the groups or socioeconomic circumstances in question. Healthy People 2020 described three major challenges for measuring health equity including, (1) “inadequate numbers of certain highly disadvantaged groups...to obtain reliable estimates”—eg, American Indians, (2) lack of any data for some minority groups—eg, transgendered patients, (3) inadequate socioeconomic or demographic information to clearly or correctly elucidate disparities in health.<sup>57</sup> Moreover, many large epidemiologic databases used to elucidate health disparities,

including those provided by the Centers for Disease Control or the Agency for Healthcare Research and Quality, contain limited patient-specific socioeconomic information, with zip code or other characteristics substituted as proxy measures.<sup>58</sup>

Outcomes measures are rapidly evolving. Mobile applications may make it easier for physicians and patients to assess and track overall health status and associated risk factors.<sup>59,60</sup> It may also be useful to find ways of utilizing existing sociodemographic or de-identified cloud-based data on patient behavior to identify high risk patients. For example patients who do not pay their credit card bills may be at higher risk for poor adherence to medication recommendations. Ideally research on social determinants of health, regardless of the tools or metrics used, will be actionable research—research that actually leads to changes in health and healthcare utilization.

## CONCLUSION

In his discussion of structural violence, Dr. Paul Farmer asks, “Does our clinical practice acknowledge what we already know—namely, that social and environmental forces will limit the effectiveness of our treatments?”<sup>7</sup> We as sub-specialists must actively seek to recognize and help address the obstacles facing our patients. It is wasteful to our patients, to surgeons and to the healthcare system to perform technically outstanding surgery that results in suboptimal outcomes due to other ameliorable factors. In an environment of rapidly evolving health policy, we need to steer rancorous policy debates toward scientific evidence about what types of interventions are effective and worthwhile.

As we have highlighted in this review article, there continue to be many gaps in our knowledge. The otolaryngology literature has generally not focused on the social determinants of health or interventions targeted at these underlying risk factors for poor patient outcomes. Attention and funding is needed to develop better and more comprehensive outcomes measures, and to determine effective strategies to improve outcomes for at-risk patient groups.

We, as otolaryngologists, are in a unique position amongst subspecialists because we care for a number of common diseases, and therefore can take a leadership role in identifying and rectifying disparities. The conditions we treat affect individuals across SES and racial boundaries. As our work and that of others has shown, disparities exist within our patient populations. From rhinosinusitis to hearing loss to sleep apnea to cancer, the conditions that we manage impact millions of individuals and lead to billions of dollars of healthcare spending every year. As such, improving healthcare disparities among our patients will not only benefit millions of individuals but may also have the added benefit of saving billions of healthcare dollars.

Research and clinical outcomes reports in otolaryngology, where possible, should include and report on variables such as race, gender, socioeconomic status, and insurance status. More focus should be placed on

interventions to improve outcomes for otolaryngic disease for marginalized groups, including targeted studies of groups with poor outcomes, and funding for such research. Advocacy efforts should be made to ensure policies that improve healthcare access and insurance coverage for our patients. Individual otolaryngology practices need to think about factors such as office wait times and availability for patients with different backgrounds and insurance statuses.

Social problems like poverty, racism and sexism are complex, enormous, and palpably uncomfortable and therefore often deemed unchangeable. That fatalistic approach, however, is frequently and unfortunately used as a justification to ignore them. Social disparities – unlike mortality itself – actually could be reduced or eliminated. The social determinants of health underlie which people become sick, how they obtain medical care and impact healthcare outcomes. Although the bottom line as impacted by new reimbursement models will be a major reason to focus on these underlying causes of illness and treatment failure, ultimately the moral burden is sufficient to take notice.

## BIBLIOGRAPHY

1. Braveman PA, Kumanyika S, Fielding J, et al. Health disparities and health equity: The issue is justice. *Am J Public Health* 2011;101(Suppl 1):S149–55.
2. Fiscella K, Franks P, Gold MR, Clancy CM. Inequality in quality: Addressing socioeconomic, racial, and ethnic disparities in health care. *JAMA* 2000;283:2579–2584.
3. Liederbach E, Kyrillos A, Wang CH, Liu JC, Sturgis EM, Bhayani MK. The national landscape of human papillomavirus-associated oropharynx squamous cell carcinoma. *Int J Cancer* 2017;140:504–512.
4. Braveman PA, Egerter SA, Woolf SH, Marks JS. When do we know enough to recommend action on the social determinants of health? *Am J Prev Med* 2011;40(Suppl 1):S58–66.
5. Braveman PA, Egerter SA, Mockenhaupt RE. Broadening the focus: The need to address the social determinants of health. *Am J Prev Med* 2011; 40(Suppl 1):S4–18.
6. Braveman P. Health inequalities by class and race in the US: What can we learn from the patterns? *Soc Sci Med* 2012;74:665–667.
7. Farmer PE, Nizeye B, Stulac S, Keshavjee S. Structural violence and clinical medicine. *PLoS Med*. 2006;3:e449.
8. Bonnefoy J, Morgan A, Kelly MP, Butt J, Bergman V. Constructing the evidence base on the social determinants of health: A guide. *Measurement and Evidence Knowledge Network (MEKN) of the WHO Commission on Social Determinants of Health*. United Kingdom: Measurement and Evidence Knowledge Network 2007.
9. Greaney TL. Accountable care organizations—the fork in the road. *N Engl J Med* 2011;364:e1.
10. Hefner JL, Hilligoss B, Sieck C, et al. Meaningful engagement of ACOs with communities: The new population health management. *Med Care* 2016;54:970–976.
11. Dupree JM, Patel K, Singer SJ, et al. Attention to surgeons and surgical care is largely missing from early Medicare Accountable Care Organizations. *Health Aff (Millwood)* 2014;33:972–979.
12. Fuchs VR. Critiquing US health care. *JAMA* 2014;312:2095–2096.
13. World Health Organization. Life expectancy at birth (years) 2000–2015. Available at: [http://gamapserver.who.int/gho/interactive\\_charts/mbd/life\\_expectancy/atlas.html](http://gamapserver.who.int/gho/interactive_charts/mbd/life_expectancy/atlas.html). Updated 2016. Accessed September 26, 2016.
14. Heiman HJ, Artiga S. Beyond health care: The role of social determinants in promoting health and health equity. *Henry J Kaiser Family Foundation*. November 4, 2015. Available at: <http://kff.org/disparities-policy/issue-brief/beyond-health-care-the-role-of-social-determinants-in-promoting-health-and-health-equity/>. Accessed December 10, 2016.
15. Office of Disease Prevention and Health Promotion: Healthy People 2020. Social determinants of health. Available at: <https://www.healthypeople.gov/2020/topics-objectives/topic/social-determinants-of-health>. Updated 2016. Accessed September 15, 2016.
16. GBD 2013 Risk Factors Collaborators, Forouzanfar MH, Alexander L, et al. Global, regional, and national comparative risk assessment of 79 behavioural, environmental and occupational, and metabolic risks or clusters of risks in 188 countries, 1990–2013: A systematic analysis for the global burden of disease study 2013. *Lancet* 2015;386:2287–2323.
17. Bauer UE, Briss PA, Goodman RA, Bowman BA. Prevention of chronic disease in the 21st century: Elimination of the leading preventable causes of premature death and disability in the USA. *Lancet* 2014;384:45–52.



18. Marmot MG, Rose G, Shipley M, Hamilton PJ. Employment grade and coronary heart disease in British civil servants. *J Epidemiol Community Health* 1978;32:244–249.
19. Hemingway H, Shipley M, Macfarlane P, Marmot M. Impact of socioeconomic status on coronary mortality in people with symptoms, electrocardiographic abnormalities, both or neither: The original Whitehall study 25 year follow up. *J Epidemiol Community Health* 2000;54:510–516.
20. Antonovsky A. Social class, life expectancy and overall mortality. *Milbank Mem Fund Q* 1967;45:31–73.
21. Victora CG, Fenn B, Bryce J, Kirkwood BR. Co-coverage of preventive interventions and implications for child-survival strategies: Evidence from national surveys. *Lancet* 2005;366:1460–1466.
22. Andrulis DP. Access to care is the centerpiece in the elimination of socioeconomic disparities in health. *Ann Intern Med* 1998;129:412–416.
23. Cohen RA, Martinez ME. Health insurance coverage: Early release of estimates from the National Health Interview Survey, 2014. *National Center for Health Statistics*. June 2015. <https://www.cdc.gov/nchs/data/nhis/earlyrelease/insur201506.pdf>. Accessed September 15, 2016.
24. The Henry J. Kaiser Family Foundation. Health insurance coverage of the total population: Timeframe: 2015. Available at: <http://kff.org/other/state-indicator/total-population/>. Updated 2016. Accessed November 11, 2016.
25. Hing E, Rui P, Ashman J. Expected source of payment at emergency department visits for adults aged 18–64 for the United States and in the five most populous states, 2012. *NCHS Data Brief* 2016;253:1–8.
26. Villarreal MA, Cohen RA. Health insurance continuity and health care access and utilization, 2014. *NCHS Data Brief* 2016;249:1–8.
27. Cheung PT, Wiler JL, Lowe RA, Ginde AA. National study of barriers to timely primary care and emergency department utilization among Medicaid beneficiaries. *Ann Emerg Med* 2012;60:4–10.e2.
28. Asplin BR, Rhodes KV, Levy H, et al. Insurance status and access to urgent ambulatory care follow-up appointments. *JAMA* 2005;294:1248–1254.
29. Rhodes KV, Kenney GM, Friedman AB, et al. Primary care access for new patients on the eve of health care reform. *JAMA Intern Med* 2014;174:861–869.
30. Weiss AJ, Wier LM, Stocks C, Blanchard J. Overview of emergency department visits in the United States, 2011: Statistical brief #174. In: Healthcare cost and utilization project (HCUP) statistical briefs. Rockville, MD: 2006. NBK235856 [bookaccession].
31. Naghavi AO, Echevarria MI, Grass GD, et al. Having Medicaid insurance negatively impacts outcomes in patients with head and neck malignancies. *Cancer* 2016. [Epub ahead of print]
32. Hing E, Rui P. Emergency department use in the country's five most populous states and the total United States, 2012. *NCHS Data Brief* 2016;252:1–8.
33. DeNavas-Walt C, Proctor BD, Smith JC. Income, poverty, and health insurance coverage in the United States: 2012. U.S. Census Bureau, Current Population Reports, P60–245. Washington, DC: U.S. Government Printing Office, 2013.
34. Scangas GA, Ishman SL, Bergmark RW, Cunningham MJ, Sedaghat AR. Emergency department presentation for uncomplicated acute rhinosinusitis is associated with poor access to healthcare. *Laryngoscope* 2015;125:2253–2258.
35. Bergmark RW, Ishman SL, Scangas GA, Cunningham MJ, Sedaghat AR. Socioeconomic determinants of overnight and weekend emergency department use for acute rhinosinusitis. *Laryngoscope* 2015;125:2441–2446.
36. Hummel K, Mohler MJ, Clemens CJ, Duncan B. Why parents use the emergency department during evening hours for nonemergent pediatric care. *Clin Pediatr (Phila)* 2014;53:1055–1061.
37. Bergmark RW, Ishman SL, Scangas GA, Cunningham MJ, Sedaghat AR. Insurance status and quality of outpatient care for uncomplicated acute rhinosinusitis. *JAMA Otolaryngol Head Neck Surg* 2015;141:505–511.
38. Bergmark RW, Sedaghat AR. Antibiotic prescription for acute rhinosinusitis: Emergency departments versus primary care providers. *Laryngoscope* 2016;126:2439–2444.
39. Bergmark RW, Sedaghat AR. Presentation to emergency departments for acute rhinosinusitis: Disparities in symptoms by race and insurance status. *Otolaryngol Head Neck Surg* 2016;155:790–796.
40. Rereddy SK, Jordan DR, Moore CE. Dying to be screened: Exploring the unequal burden of head and neck cancer in health provider shortage areas. *J Cancer Educ* 2015;30:490–496.
41. Smedley BD, Stith AY, Nelson AR, editors. Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care. Institute of Medicine (US) Committee on Understanding and Eliminating Racial and Ethnic Disparities in Health Care. Washington (DC): National Academies Press (US), 2003.
42. Dwojak SM, Sequist TD, Emerick K, Deschler DG. Survival differences among American Indians/Alaska Natives with head and neck squamous cell carcinoma. *Head Neck* 2013;35:1114–1118.
43. Dwojak SM, Finkelstein DM, Emerick KS, Lee JH, Petereit DG, Deschler DG. Poor survival for American Indians with head and neck squamous cell carcinoma. *Otolaryngol Head Neck Surg* 2014;151:265–271.
44. Dwojak S, Deschler D, Sargent M, Emerick K, Guadagnolo BA, Petereit D. Knowledge and screening of head and neck cancer among American Indians in South Dakota. *Am J Public Health* 2015;105:1155–1160.
45. Daraei P, Moore CE. Racial disparity among the head and neck cancer population. *J Cancer Educ* 2015;30:546–551.
46. Shepperd JA, Howell JL, Logan H. A survey of barriers to screening for oral cancer among rural Black Americans. *Psychooncology* 2014;23:276–282.
47. Chang EH, Lutfi W, Feinglass J, Reiher AE, Moo-Young T, Bhayani MK. National trends in the surgical treatment of non-advanced medullary thyroid cancer (MTC): An evaluation of adherence with the 2009 American Thyroid Association guidelines. *World J Surg* 2016;40:2930–2940.
48. Sandulache VC, Kubik MW, Skinner HD, Malsky JA, Gelbard AH, Zevallos JP. Impact of race/ethnicity on laryngeal cancer in patients treated at a Veterans Affairs Medical Center. *Laryngoscope* 2013;123:2170–2175.
49. Wu ES, Park JY, Zeitouni JA, et al. Effect of actionable somatic mutations on racial/ethnic disparities in head and neck cancer prognosis. *Head Neck* 2016;38:1234–1241.
50. Gillison ML, Chaturvedi AK, Anderson WF, Fakhry C. Epidemiology of human papillomavirus-positive head and neck squamous cell carcinoma. *J Clin Oncol* 2015;33:3235–3242.
51. Ellison LF. Differences in cancer survival in Canada by sex. *Health Rep* 2016;27:19–27.
52. Jaggi R, Motomura AR, Amarnath S, Jankovic A, Sheets N, Ubel PA. Under-representation of women in high-impact published clinical cancer research. *Cancer* 2009;115:3293–3301.
53. Kirk S, Milnes L. An exploration of how young people and parents use online support in the context of living with cystic fibrosis. *Health Expect* 2016;19:309–321.
54. Stevenson LA, Gergen PJ, Hoover DR, Rosenstreich D, Mannino DM, Matte TD. Sociodemographic correlates of indoor allergen sensitivity among United States children. *J Allergy Clin Immunol* 2001;108:747–752.
55. Olmedo O, Goldstein IF, Acosta L, et al. Neighborhood differences in exposure and sensitization to cockroach, mouse, dust mite, cat, and dog allergens in New York City. *J Allergy Clin Immunol* 2011;128:284–292.e7.
56. Beck AF, Huang B, Chundur R, Kahn RS. Housing code violation density associated with emergency department and hospital use by children with asthma. *Health Aff (Millwood)* 2014;33:1993–2002.
57. Department of Health and Human Services. Phase I report recommendations for the framework and format of Healthy People 2020: Appendix 11 - measuring health disparities and health equity. Available at: <http://www.healthypeople.gov/2010/hp2020/advisory/phasei/appendix11.htm>. Updated 2008. Accessed September 10, 2016.
58. Centers for Disease Control and Prevention. About the ambulatory health care surveys. Available at: [www.cdc.gov/nchs/ahcd/about\\_ahcd.htm](http://www.cdc.gov/nchs/ahcd/about_ahcd.htm). Updated 2016. Accessed November 15, 2016.
59. Mandl KD, Mandel JC, Kohane IS. Driving innovation in health systems through an apps-based information economy. *Cell Syst* 2015;1:8–13.
60. Mandl KD, Mandel JC. Building a self-measuring healthcare system with computable metrics, data fusion, and substitutable apps. *BMJ Outcomes* 2015;2015:6–13.